

Sheep Management *for* Oklahoma Farms



OKLAHOMA AGRICULTURAL EXPERIMENT STATION

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On the Cover

The 1st prize Hampshire flock at the Southwestern Live-stock show, Fort Worth, Texas, in 1944 is shown in the picture. This flock also won the Sheep Breeders magazine "Gold Bell" award for the best flock of any breed. These sheep were all bred for two generations by Oklahoma A. & M. College, and were fitted and shown by the College.

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Sheep Management for Oklahoma Farms

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SHEEP ARE SUITED TO OKLAHOMA

Sheep enjoy some special advantages on Oklahoma farms as compared to other classes of livestock. It is not suggested that they replace other livestock, but they can be profitably worked into a well rounded program. The special advantages they have are as follows:

1. Sheep produce two cash crops a year—lambs and wool. These crops usually come at a time when cash income is low on the farm. Having two crops reduces the chances that the produce will be sold under low market conditions.

2. Sheep eat 90 percent or more of the weeds common to Oklahoma. This makes them valuable in cleaning up pastures and at the same time turning this waste into money. Weed control aids in establishment of grass in pastures and adds to the appearance and value of the farm.

3. Sheep are among the most efficient animals for turning rough or coarse feeds into salable products. Most farms can maintain a small flock on feed that is otherwise wasted.

4. It takes less grain to produce desirable market finish on lambs than on other classes of livestock sold at young ages. Good pasture and ample roughage will maintain the breeding flock and produce fat lambs even though little grain is produced on the farm.

5. It is easy to raise a balanced ration on the farm for sheep, and the purchase of feeds other than salt, limestone and bonemeal is usually unnecessary.

6. The care that sheep require usually comes at a time when crop work and other livestock work is not pressing. This aids in distributing the rush of farm labor and affords profitable use of slack time.

Sheep properly handled will make a good return on the investment and pay well for labor, feed and equipment used. They return more per dollar invested than other classes of livestock be-

This circular was prepared to give information on the raising of sheep in Oklahoma, and especially on questions most often asked in letters received by the Division of Agriculture at the Oklahoma A. & M. College. Information on parasites and diseases of sheep is given in a separate Experiment Station publication.

cause the investment in breeding stock is low. But it should be remembered that they require more labor in proportion to the investment in breeding stock than is true of beef cattle.

Sheep often produce a lamb crop that will more than pay for the original ewes, and a wool clip pays for the harvested feeds fed. At such favorable prices sheep raising is very profitable; nevertheless there are expenses of operation, including labor, flock depreciation, death loss, housing, and others. Ten or fifteen percent net on the investment can be expected over a period of time if sheep are properly handled. Small farm flocks of from 35 to 100 head of sheep can usually be considered a good investment without undue speculation being involved.

The season when the lamb crop is to be marketed will usually determine the entire production program; and the lamb marketing season in turn depends on the type of area farmed and the equipment available.

TYPES AND BREEDS OF SHEEP

The two types of sheep commonly recognized in the United States are the mutton and wool types. While there are several breeds of each type, only a few breeds are commonly used in Oklahoma. The backbone of Oklahoma's sheep industry is the use of purebred mutton rams on grade fine wool ewes, commonly called Texas or western ewes.

Classification of Breeds

The following classification lists some of the more common breeds in the United States:

Type	Wool Class	Breed
Mutton	Medium	Shropshire
		Hampshire
		Dorset
		Southdown
		Suffolk
	Long Wool	Corriedale
		Lincoln
		Cotswold
		Leicester
		Fine Wool
Rambouillet		
		Merino

The Mutton Breeds

The mutton breeds of sheep, developed primarily for excellence of carcass form, in general mature early, are wide backed, have good loins, and carry fullness in their rear quarters not found in other sheep. They should be low set, short and compact in their bodies and have a tendency to fatten readily and easily.

Among the conditions that suit either an area or farm for sheep are:

1. Long pasture season, using either permanent or temporary pasture crops.
 2. Lack of excessive rain.
 3. Good soil drainage.
 4. Freedom from large numbers of stray dogs and coyotes.
 5. Pasture areas that are well fenced.
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Most breeds produce a fair clip of quarter blood and $\frac{3}{8}$'s blood wool, although some breeds and individuals may produce a finer or coarser fiber.

Hampshire.—The Hampshire is the largest breed of sheep commonly found in Oklahoma. A good index of the favor this breed has found in the state has been its great increase in popularity since 1930 and the strong demand for commercial rams. In addition to their size and general ruggedness, their distinguishing characteristics are large dark or black ears, black face and feet, and heavy bone. In recent years many purebred breeders have bred for wool covering on the face, but farmers have not particularly worried about face covering and some prefer the cleaner faced rams.

Really heavy-headed and heavy-boned rams should probably not be used on small or young western ewes, or the death rate of lambs at lambing may be high; older and larger ewes are not so likely to experience trouble. A better policy is to use good-bodied, thick-fleeced rams without unnecessary coarseness.

The Hampshire breed furnishes rams that are active and sire growthy lambs. Hampshire cross bred lambs sell well if they have been fed enough to get their larger frames well covered. The ewes of the breed are good milkers but do not shear particularly heavy fleeces. As a rule the ewes breed earlier than Shropshires, and this has increased their popularity somewhat as a farm flock ewe. To date the breed's greatest usefulness has been in supplying rams for use on fine wool ewes.

Dorset.—The Dorset is easily distinguished from the other mutton breeds because of the presence of horns on both rams and ewes. Very little wool is present on the face and below the knees and hocks; the color markings of these points and the ears are

white. Often Dorsets have only a light cover of wool on the underline, and a heavy wool clip is not one of the strong points of the breed.

Rams of the breed are more energetic than rams of other mutton breeds and have won popularity for early breeding in hot weather. The ewes, like fine wool ewes, breed earlier than common in most breeds. The Dorset ewe is not excelled for prolificacy or heavy milking.

Dorset lambs or Dorset cross-bred lambs are desirable if marketed at proper weights. Roughness, resembling the rams, may occur if wether lambs are carried to excessive weights.

Dorset rams have been in great demand and breeders have not always been able the past few years to supply the demand for good purebred rams. Dishonest persons have sometimes sold nondescript horned rams as Dorsets. While ewes of the breed have been too expensive for general commercial lamb production, cross-bred ewes sired by Dorset rams have proven very satisfactory in cases where they have been used. Their only disadvantage as compared to fine wool ewes is that it costs more to produce or buy them than the usual purchase price of the smaller fine wool ewes.

Shropshire.—The Shropshire is a popular farm flock sheep. It produces an excellent fleece as compared to most mutton breeds. While it is not as large as the Hampshire, nor as perfect in mutton form as the Southdown, the rams of this breed cross well with fine wool ewes. The combination of fair size and thickness coupled with quality and lack of coarseness produces a thick lamb that is not exceptionally large at birth but grows well with ample milk. Shropshire ewes are quite prolific, are fair milkers, and good mothers. Ewes will usually shear 9 to 10 pounds of wool.

Typical Shropshires have a complete wool cap over the head and face and the legs are usually woolled to the ground. The most desired color of face, ears and feet is a very dark brown. Typical breed representatives have smaller ears than other breeds and lack the size of bone carried by most other sheep.

Southdown.—No breed of sheep excels the Southdown in excellence of mutton form or carcass quality. This breed has won more on-foot, carcass, and carlot show competitions than any other breed. Southdowns are smaller than the other mutton breeds common to this section. They are very compact, low-set, and have considerable development of the back, loin, and legs. The face usually has only moderate wool covering and the face and hair

color varies from mouse grey to light brown. The wool is usually very dense but shorter than found on the other mutton breeds.

The Southdown produces a lighter wool clip than the Shropshire and Hampshire. This, coupled with their smaller size has retarded them from becoming a popular farm flock sheep.

Southdown rams produce very high quality lambs when crossed on western or fine wool ewes. The lambs are usually very uniform in type, size and markings. The lambs fatten readily and their smaller size is often compensated for in an increased price per pound. Commercial producers usually prefer good bodied rams that are large for the breed rather than small, refined rams. Such rams have proven useful in producing early milk lambs.

Southdowns have become very popular in the state for the production of fat lambs to be exhibited in junior fat stock shows.

Suffolk—The Suffolk is a black-faced breed without wool on the head or face and without wool below the knees and hocks. The unwooled areas are almost jet black in color. Because of their clean faces and lighter bone they have become popular as a black-faced breed to use on fine wool ewes under range conditions. The rams are very active. The best specimens of the breed have excellent bodies and good tops but shear light fleeces.

Good Suffolk rams should be valuable in Oklahoma but as yet they are difficult to obtain as there are very few purebreds in this or surrounding states. Because of the growing popularity the breed prices on good individuals have been high. This condition has led to many inferior rams selling at prices far in excess of their commercial worth in siring good market lambs.

Corriedale.—The Corriedale breed originated from crossing fine wool and long wool sheep. They are an open white faced breed that has grown in popularity on the western range. They resemble the fine wool breeds in grazing characteristics and breeding habits. Flocks of high grade or cross-bred ewes carrying Corriedale breeding should be useful. The breed shears a heavy fleece of high value medium wool. Some rams of the breed do not carry the natural fleshing needed to sire top milk lambs. Their popularity in some areas has resulted in inferior individuals commanding prices in excess of their worth.

The Long Wool Breeds

Very few long wool sheep have been used in the Southwest and no purebred flocks are located in this area at present. The

long wool breeds are very large sheep with good bodies. They produce long fleeces of very coarse wool. They have been used extensively in the United States and other countries for cross breeding.

Rams, particularly of the Lincoln breed, have been used successfully on fine wool ewes in Oklahoma. This cross produces acceptable market lambs; and the ewe lambs, when grown out and retained in the breeding flock, are large and vigorous. They produce a large lamb crop, are good milkers, and shear heavy fleeces of quarter blood wool. These cross-bred ewes are usually bred to rams of one of the medium wool breeds.

The Fine Wool Breeds

The backbone of Oklahoma's sheep production has been and will probably continue to be the fine wool ewe. The fine wool breeds have been developed with almost as much attention being given to the quality and weight of wool produced as to production of lambs. Considerable improvement has been secured in the fine wool breeds in recent years in producing larger and smoother sheep with more acceptable mutton confirmation.

Rambouillets far surpass Merino in popularity throughout the United States and have found greater favor in the Southwest. In Oklahoma, fine wool ewes of Rambouillet breeding have been preferred because of their larger size, greater smoothness, and mutton confirmation. Fine wool sheep tend to graze together or have greater "flocking instinct" than the mutton breeds. This characteristic makes them popular under range conditions and is not harmful under farm conditions. Fine wool are hardy and have the ability to exist, if need be, on scant vegetation.

Fine wool ewes lamb earlier than most ewes of the mutton breeds. This characteristic has made them very popular in Oklahoma. There has been only very limited demand for fine wool rams in Oklahoma; there are no purebred Merinos and very few purebred Rambouillets in the state. Most of the fine wool ewes brought into the state have a predominance of Rambouillet breeding, but many carry some Merino breeding.

ESTABLISHING A FARM FLOCK

Before a farm flock is established one must decide what is expected of it. Different items must be considered if it is to become a major enterprise on the farm rather than being expected to fit into already existing practices. In general, sheep can be fitted into the existing farm plan with only minor alterations in the farming program. It is usually most economical to keep the ewe flock in what might be termed "ram units" of from 30 to 35 head.

Selecting Foundation Animals

EWES.

Before the breeding ewes are purchased one should decide whether (1) early lambs are to be marketed before hot weather or (2) late lambs are to be sold in the early winter months after having been fattened on harvested feeds or wheat pasture. In most areas of the state the former method will be found most economical because it makes a maximum use of winter and early spring pasture. It is difficult to keep lambs growing and healthy during the season of hot weather and sparse feed that often prevails in Oklahoma during the dry months of late summer.

The beginner should keep in mind that the mouth and udder are very important parts of the producing ewe, and she is almost useless unless both are functioning. A ewe that does not have a sound mouth cannot eat properly and handle enough food to raise a lamb, and the food she eats is lost unless the ewe milks well to feed the lamb. Only sound udders will do this job. With a little practice even a beginner can quickly determine if the udder is pliable and warm, free from lumps, and has normal teats. A beginner can easily learn to tell if the ewe's mouth is sound by following the description given on pages 13 to 15.

Native Ewes.—Native ewes are often found useful by the producer who wants only a few ewes and does not care particularly about marketing exceptionally early lambs. The foundation ewes can usually be secured locally from neighbors, and flock replacements are usually saved from the ewe lamb crop. Available native ewes are mostly black-faced and generally have a predominance of Shropshire or Hampshire breeding, although some Southdown ewes may be available. Occasionally white-faced natives carrying Dorset blood can be obtained. These breeds usually show a more desirable mutton confirmation than do fine wool or western ewes. Native ewes also produce a larger lamb crop or higher percentage of lambs, and the financial return on the wool clip from a well bred native flock usually exceeds that of a fine wool flock.

Native ewes have some disadvantages, especially for the commercial lamb producer. Native sheep are usually more heavily infested with internal parasites, particularly stomach worms, nodular worms and large tape worms. It is also hard to obtain more than a few native sheep at one time of the age, breeding and quality one desires. When such sheep are obtained they usually cost several dollars per head more than ewes raised on the range. Probably the most serious objection to native ewes is that few of them will lamb

early enough to get lambs on the market when most Oklahoma lambs should be sold—before the first of June.

Western Ewes.—So-called Western or fine wool ewes are very commonly used in Oklahoma. Although usually called Westerns in this state, most of them come from southwest Texas.

Western ewes enjoy several advantages as compared to natives, when used properly under Oklahoma conditions: (1) They will ordinarily breed and lamb earlier, which is a decided advantage in making maximum use of winter wheat pasture in lamb production. (2) It is easy to obtain Western ewes in any number or age a producer may desire. (3) Range raised sheep usually have fewer internal parasites and are therefore more healthy. (4) The initial investment in ewes is usually less, and they require less feed per head than larger native ewes.

The beginner should be aware of the disadvantages of fine wool ewes. They usually must be obtained from a considerable distance, and often they are disappointing in not having particularly desirable mutton confirmation. They are likely to have fewer twins than natives, and are more nervous at lambing time; but they do make good mothers if properly handled.

There are two things to remember if fine wool ewes are used. First, the ewes must be bred to good purebred mutton rams that will give the lamb crop thickness of fleshing. The ewes are good milkers if well fed, and plenty of milk plus inherited thickness from the ram makes the lamb desirable for the market. Second, the lambs must be pushed along to market at an early age of four to five months. As they get older, they lose their milk fat and their lack of correct mutton confirmation begins to become more evident.

THE RAM.

Only purebred mutton rams should be considered for use on commercial ewes. Experimental data at the Oklahoma Station* show that lambs sired by good purebred mutton rams and out of scrub ewes were heavier at weaning, weighed 8.2 lbs. more when fattened, and sold at 5 percent more per pound than lambs out of similar ewes sired by a scrub ram. The difference would be about \$2.15 per head at 1948 prices.

Choice of breed is largely a matter of personal preference. There is considerably more difference among individuals within

* *Scrub vs. Purebred Ram*, by A. E. Darlow, Okla. Agri. Exp. Sta. Bul. No. B-151.

the mutton breeds than there is among the best rams of the various breeds.

Commercial operators ordinarily figure about three rams per 100 ewes, or approximately 30 to 35 ewes per ram.

The cost of using a high quality purebred ram is only a minor cost in sheep production. Ordinarily, high quality rams can be bought for \$50 or less. When one considers that the ram may sire 35 or 40 head of lambs per year and be used over a four- or five-year period, his service cost per ewe is quite small. Market men in Oklahoma have noticed that when a man once uses a purebred mutton ram and sells lambs from such a sire, he seldom hesitates to get as good or better ram next time.

Ram lambs cannot be expected to give as satisfactory service as older rams. The commercial operator breeding for early lambs should avoid using rams that are less than one year of age.

POINTERS ON BUYING SHEEP.

Estimating Age By Teeth.—The age of sheep is very important. Old sheep are unable to use feed to as good advantage as sheep still young enough to have good mouths. Sheep are comparatively worthless as breeding animals when their mouths wear out. Some sheep retain the full use of their teeth to comparative old age, but after the animal is six years old one can expect trouble from their mouths. It therefore is very important that the beginner learn how to tell the approximate age of sheep. This can be done by examining the front (incisor) teeth. Sheep also have molar teeth in both upper and lower jaws. The molars are the most important teeth in chewing feed, but they are not readily examined. The condition of the incisors or front teeth is a reliable index of the condition of the molars.

Lambs are born with eight milk teeth (incisors) arranged in four pairs in the lower jaw. (See diagram, page 14.) These teeth remain in place until replaced by the permanent or mature teeth. The center milk teeth are shed at approximately one year of age and are replaced. For this reason, yearling sheep are often referred to as "two-tooth sheep." At two years of age the second set of permanent teeth replace the second pair of milk teeth; and at three and four years, respectively, the third and fourth pairs of permanent teeth crowd out the milk teeth. The sheep then has, at four years of age, what is called a "full mouth." Like any general rule, exceptions can be found, and one should not be alarmed if occasionally sheep of known age do not conform perfectly to this dental pattern.

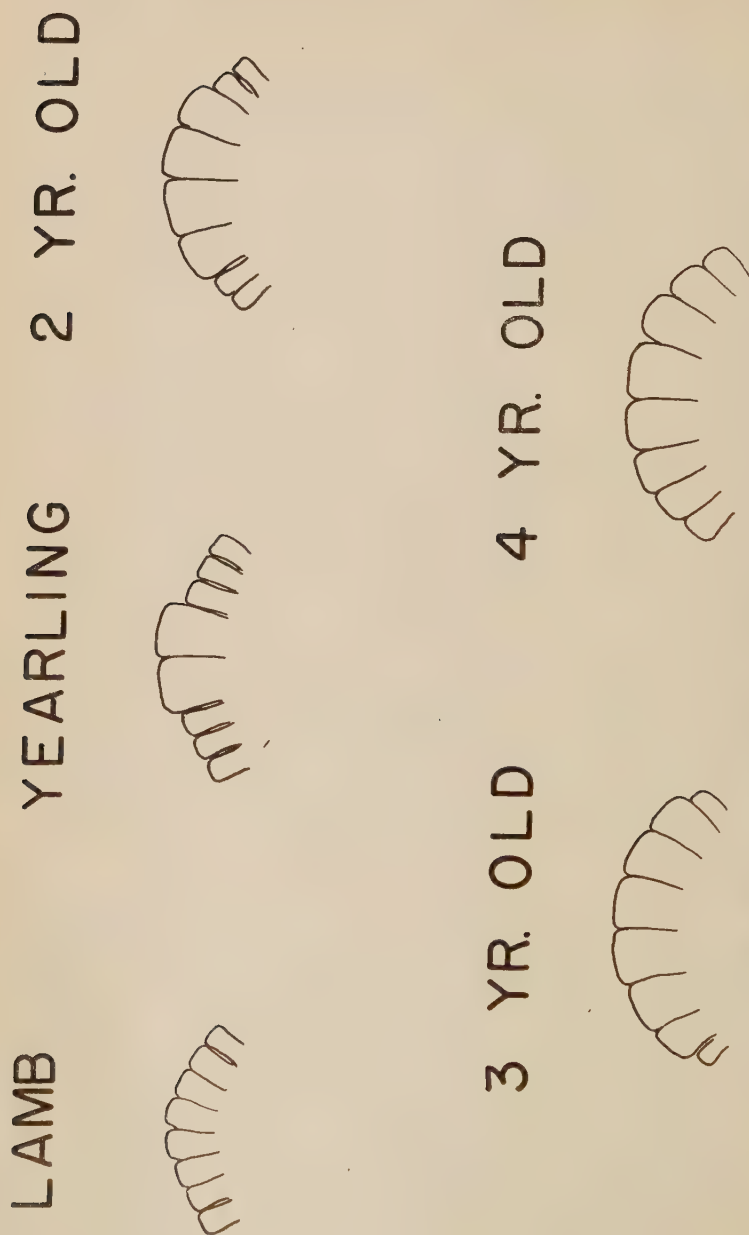


FIGURE 1.—Arrangement of Teeth in Sheep of Various Ages.

After sheep are four years of age teeth are no longer entirely dependable in estimating age. Usually at five years of age the teeth are spreading somewhat, while at six this characteristic is often quite pronounced and the sheep is referred to as a "spreader." After the sheep is six year old, one or more teeth may be missing and the sheep will have what is termed a "broken mouth."

Common Market Classes of Ewes.—Range ewes are usually sold by age groups, and native ewes may also be sold by age. The age classes generally used are (1) yearlings, (2) twos and threes, (3) solids and (4) broken and spreaders. Yearlings are young ewes that have not ordinarily lambed, while two and three year old ewes have had an opportunity to have one or two lamb crops. Solid mouthed ewes are either four or five years of age, while spreader and broken ewes are usually six or over.

Original cost should not be the only consideration in buying ewes, although it may be an item. The expected life of the ewe, possible salvage value, and feed bill are also important. Young ewes are usually the most economical in the long run, but older ewes are easier for beginners to handle the first year. Ewes without good teeth are a poor investment because of the extra food and care needed to get them through the winter and nursing seasons.

Time To Buy.—Western or fine wool ewes are usually available from the ranges at the close of the shearing season in late April, May and early June. It is usually advisable to buy them at that time if possible. Native ewes may be available at any time, but are usually most easy to secure in the fall of the year or when their lambs have been weaned.

It is usually a better policy to buy open ewes and breed them than to attempt to buy bred ewes. Good pregnant ewes usually are more expensive than open ewes, and one often has little assurance of when or to what the ewes were bred.

Equipment for the Farm Flock

FENCES.

There is an old saying that "Good fences make good neighbors." This is certainly true where livestock is being handled. Sheep do not have as rigid fencing requirements as hogs, but they do require better fencing than is sometimes used for cattle. Sheep fencing need not be expensive. The ordinary cattle fence can be made suitable for sheep by adding two or three barbed wires. If one is building a fence exclusively for sheep, a very satisfactory

fence can be made with five wires; but a combination cattle and sheep fence needs six or seven wires because the fence must be higher than is needed to turn sheep alone. Electric fences are not satisfactory for sheep.

Woven wire makes the best sheep fencing, but it is more expensive than barbed wire. If the pasture is fenced hog-tight, the fencing question has, of course, been answered. Woven wire used only for sheep can be lighter than is needed for hogs.

It is an excellent practice to have a dog-proof corral in which the sheep can be confined at night. A dog-proof corral should be made of woven wire and should be approximately six feet in height. It is a good precaution to have a barbed wire around the bottom to keep dogs from digging under.

HOUSING.

The housing requirements of sheep—like the fencing requirements—are not too exacting, but a few fundamentals should be kept in mind. A good sheep shed has three basic requirements: (1) Dry over head, (2) dry under foot, and (3) free from drafts. In addition, the producer always likes to have a shed conveniently located and readily accessible to the pastures.

A well constructed three-sided shed, open to the south, makes very adequate shelter for the flock in Oklahoma, except that some added protection may be needed for use with baby lambs. If lambs are to be dropped during cold weather, one end of the shed should be closed in for the lambs.

Unused quarters in a horse barn or other suitable building can often be made satisfactory for sheep without undue expense. In remodeling, provide plenty of ventilation and make the door of ample size. Most people confine sheep too closely; as a result, the sheep prefer to lie outside rather than stay in what appears to be a very comfortable building.

If sheep are allowed access to a barn or shed during hot summer weather, arrangements should be made to raise the lower part of the north wall to let air to pass through. Unless special ventilation is provided at the floor level, a building makes very unsatisfactory shade on a hot day.

WATER TANKS AND FEEDERS.

An adequate water supply near the sheep quarters is important. Sheep drink considerable amounts of water and should be allowed all they desire. Any type of tank that will allow the sheep to drink

and is easily cleaned will be satisfactory, but it must be arranged so lambs cannot get into the water container and drown.

There are many satisfactory types of feeders for sheep, but economy of construction and convenience in handling and cleaning are the factors usually given most attention when building this equipment. Sheep need from 1 to $1\frac{1}{2}$ linear feet of trough space per head for the feeding of either grain or hay. Adequate space should be allowed so all sheep can eat at one time. Almost any type of feeder that will keep the sheep out of the trough and prevent the wasting of feed is satisfactory. Feeders should be built so hay will not get on the backs of the sheep. A combination hay and grain trough is especially desirable because of its economy.

FLOCK CARE THROUGH THE SEASONS

Breeding Season

TIME TO BREED EWES.

The breeding season for the commercial operator depends upon the breed of ewes used as foundation stock. The mutton breeds will not usually breed until fall, but fine wool ewes will generally take the ram several months earlier or in the early summer months.

Some producers do not wish to lamb early because of lack of winter feed and proper housing, and as a result do not expect to breed their ewes until the weather is cool. On the other hand, some commercial operators plan to have their ewes lamb in late fall or early winter; and consequently they breed for much earlier lambing. Such early lambing necessitates turning the ram with the ewes in the late spring or early summer season. This is a very common and highly recommended practice in Oklahoma, because our breeding season is much more satisfactory if ewes are settled prior to the hot summer months of July and August. If the ewes are allowed to remain open during the hot summer months and are not bred until the cool weather in the fall, the lambs are too late to meet satisfactory market size and finish before the first of June the following year.

CONDITION OF EWES AT BREEDING TIME.

There is a difference of opinion among sheep men as to how fat ewes should be at breeding time, but most good operators feel that the ewe in just good-average breeding is preferable to the ewe that is either excessively fat or too thin. Eight years' experimental

evidence at the Oklahoma Station indicates it does not pay to feed much grain at breeding time. It was formerly thought that having ewes in rising condition at the time of breeding (usually referred to as "flushing" the ewes) would increase the number of twins, bring the ewes into heat more uniformly, and cause the ewes to settle more easily. "Flushing" was accomplished by feeding grain or use of lush pasture. These ideas were not confirmed in the Oklahoma study. On the other hand, studies of ram semen indicate that there is a very low fertility of some rams during exceptionally hot weather, and consequently the number of ewes settled during a hot spell may be limited.

Such measures as will aid the ram in keeping cool and in not expending an excess amount of energy in finding ewes that are in heat will probably pay off in bigger returns than will just flushing. It is a good idea to shear the ram entirely. If that is not possible, then his belly should be sheared during the breeding season. It is also a good plan to remove dung locks from the rear of the ewes and have their rear quarters cleaned up so the ram can make contact.

Ewes that did not raise lambs the year before should not be allowed to become excessively fat before the breeding season starts. Ewes that are not nursing lambs in the late spring should be removed to some of the poorest pasture on the place and not allowed to gain excessive weight.

AGE WHEN FIRST BRED.

Most commercial operators in the Southwest area wait until ewes are past one year of age before breeding them for the first time. Usually, the ewe is first bred when it is between 14 and 18 months of age. Producers that are using native mutton ewes sometimes wish to breed them the first fall, as ewe lambs. Experimental evidence shows that ewe lambs may be bred their first fall, but that they will usually lamb late following such breeding and will not grow quite as large a lamb as will an older ewe. A group of ewe lambs can usually be expected to raise a little over one-half lamb per head the first year. They require extra care at lambing time and have a slightly higher mortality during lambing, so most breeders do not find it worthwhile.

MANAGEMENT OF THE RAM.

The number of ewes one ram will serve during a breeding season depends upon a great many factors. Ordinarily the commercial operator practices field mating of his ewes; that is, he

turns the ram with the ewes and allows them to run together all the time. This, of course, makes for ease in handling of the ram and for less work in the total breeding operation, but it also requires the greatest number of rams for a given number of ewes. Commercial operators ordinarily figure about three rams per 100 ewes or approximately 30 to 35 ewes per ram. During the very hot weather in Oklahoma, one should use at least three rams per 100 ewes. During an exceptionally warm spell, four rams per 100 ewes would be more advisable.

The service of the ram may be greatly extended by hand breeding. Hand breeding merely means that the ram is taken away from the ewes, and ewes in heat are found by means of a "teasing" ram, thereby saving the energy of the breeding ram for breeding the ewe. A common, cheap ram can be used as a "teasing" ram by merely tying a sack over his sheath and turning him with the ewe flock. The ewes that are in heat are removed as soon as they are found, and are later exposed to the desired ram.

Some operators find it advisable to extend the service of the ram by allowing him to run with the ewes only during the cool of the night and keeping him away from the ewes and in the shade during the daytime. When this plan is followed, it is customary to feed the ram some grain to keep him in top breeding condition during the mating season.

Ewes come in heat normally every 16 or 17 days and usually remain in heat from 24 to 36 hours. Breeding during the last 12 hours of the heat period increases the chances of conception.

The lambing period can be expected to start 145 to 148 days following the date on which the rams were turned in with the ewes.

It is a good idea to follow the breeding behavior of the ram by painting his breast daily with a paint pigment in a non-drying oil such as mineral oil or thin crankcase oil. By changing the pigment every sixteen or seventeen days, one can easily tell which ewes are returning to heat and thus find out the percentage of ewes the ram is settling as they come into heat.

The ram should not be in too high condition prior to breeding season, but, on the other hand, should be kept in good breeding condition the year round. It is a good idea to keep the ram away from the ewes except during the breeding season. Allowing the ram to run with the ewes the entire year leads to a badly scattered lamb crop. The ram running the whole year with ewes

becomes over-fat, particularly during the season of the year when the ewes are being fed rather heavily to nurse their lambs. He may knock the ewes around during pregnancy and there is a danger of rough treatment causing abortion. It is a good idea to remove the ram from the flock in time so the lamb crop will not run too late; many operators prefer to raise no lamb at all rather than to raise an exceptionally late lamb.

Feeding Bred Ewes

GENERAL NUTRITIVE REQUIREMENTS.

During the early stages of pregnancy the ration of the ewes need not be given particular attention, providing the ewes were in good breeding condition at the time they were served. But if ewes were exceptionally thin when they were bred and abundant high quality pasture is not available, some grain should be fed.

During late pregnancy, the nutritive requirements are more exacting, particularly if the ewe is not in good condition. The ewe should be allowed to gain between 25 and 30 pounds during the time she carries her lamb. This compensates for the loss in weight at lambing time and prepares the ewe to produce an adequate milk flow. Beginners in the sheep business are often fooled in the appearance of the ewes, feeling that the ewes have gained in condition when they have only grown more wool. One may check the condition of ewes by putting the hand on the back of the ewe sometime when she is around the feed trough. The gain of an ewe during pregnancy can be made very satisfactorily during the last six weeks of the pregnancy period; there is experimental evidence to show that the gain may be made just as satisfactorily during the latter stages of pregnancy as over the entire period.

The Oklahoma A. & M. College gets a good many letters each year from sheep men who complain that the ewes have no milk at the time they lamb and fail to claim their lambs. The trouble is usually the result of the ewe having been improperly nourished. Since she does not have milk in her udder she has developed no maternal instinct. This condition might be referred to as "no milk" disease and is readily corrected by having the ewe in good condition at the time she lambs. Very seldom does a ewe fail to claim her lamb if she has milk available for the lamb to nurse when it goes after its first meal.

USE OF PASTURE.

Plenty of good pasture makes an ideal feed for the bred ewe. Abundant green winter pasture is usually all the feed needed, whether the ewes are nursing lambs or not. It is very difficult to improve on good winter wheat pasture or on pasture of winter oats, barley or rye. When winter grain pasture is not available, ewes can be allowed to graze old grass pasture; but dried grass pasture should be supplemented either with legume hay, such as alfalfa, or with approximately $\frac{1}{4}$ lb. of protein supplement per head per day.

DRY-LOT FEEDING.

When good wheat or other green pasture is not available in the wintertime, it is easy to make satisfactory dry-feeding rations for pregnant ewes. Good legume hay such as alfalfa or lespedeza is all the feed needed during most of the pregnancy period. It is a good idea to add approximately $\frac{1}{2}$ pound of grain such as oats, barley, or possibly even corn, during the last 30 days before lambing.

If non-legume roughage such as prairie hay, sorghum fodder or sudan hay is used for pregnant ewes, the ration should be supplemented with approximately $\frac{1}{4}$ pound daily of cottonseed meal or other similar high-protein supplement. It takes approximately 3 pounds of silage to equal 1 pound of hay. In addition to a full feed of roughage, grain should be fed prior to lambing as suggested above. When non-legume roughages are used it is also a good idea to add approximately $\frac{1}{4}$ ounce of ground limestone per day to the ration to compensate for the calcium carried in legumes that is not present in the non-legume hay.

High quality silage can be used very satisfactorily in the ration of breeding ewes. It should be supplemented the same as non-legume roughage. The amounts of hay and grain or other feeds that sheep need depends, of course, upon the age of the sheep. Large ewes will usually eat about 4 pounds of dry hay a day. Ordinarily, pregnant ewes are not fed over $\frac{1}{2}$ pound of grain per day, but with thin ewes this amount can be safely doubled or tripled. Amounts of grain in excess of $1\frac{1}{2}$ pounds a day are usually not advised.

MINERALS.

A simple mineral mix of equal parts finely ground limestone, steamed bone-meal and salt can be kept before the ewes at all times. It is usually advisable to put additional salt in an ad-

joining box so that the ewes may have either mineral or salt, free choice. If only a mineral box is kept before the sheep, use two parts of salt for each part of the other minerals in the above mixture.

FEED COSTS.

Feed costs will vary with the amount of harvested feeds used in carrying the ewes through the winter. A very high percentage of the total cost of the ration ordinarily can be secured from pasture, either green or cured; and consequently the feed cost per ewe is usually quite low during the wintering season. In case the ewes are nursing lambs during the wintering period, the feed costs will be somewhat higher. The nursing ewe, like the dairy cow, can produce milk only if she has feed over and above what she needs to maintain her own body. Ewes that lamb during the fall or winter period will need grain while they are nursing the lambs unless winter small grain pasture is abundant; and the lambs will need to be creep-fed to reach top market condition.

Lambing Season

The lambing season is really the harvest time in the sheep business. There is no advantage in doing a good job with a ewe the entire year and then losing the harvest. Someone should be on hand to see that the ewe gets the attention she may need when her lamb is born, and the ewe and lamb should have the best care that can be given.

THE LAMBING PEN.

Disregarding sound management practices during the lambing season is a good way for the sheep producer to get into trouble. Housing for the ewes following lambing should be prepared several days before the first lamb is expected.

Probably the most useful piece of equipment around a flock of sheep is the so-called "lambing pen." This pen can be 4 by 5 feet for the average sized ewe, but larger ewes may need a pen 5 by 5 feet or larger. There are so many advantages to a lambing pen that it is considered standard equipment on most good sheep farms. It helps to get the lamb and ewe started off in good shape together, and the caretaker can very easily determine if the lamb is getting the proper amount of milk.

The pen should, of course, be clean; and it should be bedded very lightly so the lamb will not become entangled in excessive bedding.

The ewe may be confined to the lambing pen prior to lambing, or she may be allowed to lamb with the rest of the ewes and then moved to her temporary quarters later. Many operators prefer to allow the ewe to lamb before moving her to the lambing pen, so that the pen will not have to be cleaned immediately to remove afterbirth and the fluids accompanying birth. When the ewe is placed in the lambing pen after lambing, one should always check to be sure her teats are not tightly plugged. This can be quickly accomplished by drawing a little milk out of each teat.

HELPING EWES IN LABOR.

It is a good practice to allow the ewe to labor at least one hour before she is given any assistance whatever. If she has not lambed after an hour of labor, examine her to be sure that the lamb is in proper position for delivery. Before examining the ewe, the attendant should trim his nails and disinfect his hands.

Normal position for delivery is with the head laid between the front legs. If the ewe needs some assistance, the lamb should be straightened out very gently. In straightening out a lamb it is a good idea to put a disinfected string on the legs so that the feet will not become lost during the time that the body of the lamb is being adjusted. Haste at such a time is worse than no help at all, and the lamb should be adjusted into a normal position very easily. When applying pressure or pulling on a lamb to assist the ewe, the lamb should be pulled down towards the hocks of the ewe. A firm but steady pull should be applied, but only when the ewe strains. Only the front legs should be pulled upon, as this tends to straighten out the shoulders and allow them to slip by the pelvic arch. Turning the lamb slightly to one side as one pulls downward will often permit the shoulders to slip more easily by the pelvic arch.

When one has had considerable difficulty in delivering a lamb it is well to give the ewe a douche of a mild disinfectant prepared according to the manufacturer's directions.

FEEDING THE EWE.

The feed of the ewe can be increased or decreased depending upon the manner in which she is feeding her lamb. If she has insufficient milk the lamb may need additional milk from another ewe for a day or two until the mother starts giving enough to care for her own young. Feeding the ewe heavily during this period on oats and bran may help to increase the milk flow. If, on the other hand, the ewe has more milk than the lamb can take, the milk may be used to good advantage on lambs whose

mothers are not giving enough, or her flow can be decreased somewhat by feeding her only a high quality roughage and omitting grain for the first few days or until the lamb is able to take the milk.

PLACING LAMBS WITH MOTHERS.

There is usually very little trouble in getting a ewe to take a lamb if she has milk in her udder. In case she does show some hesitancy in claiming her young, the mucous from the lamb can be wiped over her nose. Smearing wheat bran over the new-born lamb, particularly if the ewe has been eating this feed previously, will often get her to start licking the lamb and she will then claim it. A few ewes may be persistent in refusing to take their lamb, and in such case it may be necessary to halter and tie the ewe. In certain instances it may help to tie one hind leg back so she cannot kick the newborn lamb.

Every ewe that has a lamb, whether it survives or not, should nurse a lamb. A ewe that loses her own lamb can be given one of a pair of twins or a motherless lamb. Getting ewes to adopt a newborn lamb from another ewe is often an easy task. Some people recommend placing the skin of the ewe's own dead lamb on the lamb that one wishes her to adopt. Or mucous from the dead lamb may be smeared on the ewe and on the lamb to be adopted. Holding a ewe to nurse for a few times, or perhaps tying her, will often aid in getting her to adopt a lamb.

Lambs occasionally are born in cold weather and become chilled before a caretaker finds them. Such chilled lambs can usually be revived. A very effective stimulant is some of the mother's own warm milk placed on the lamb's tongue. The lamb may be warmed by placing it in a basket with a jug of hot water. The lamb should be placed on a warm blanket, stretched around the jug, and then covered.

CARE OF NEW-BORN LAMBS.

There are a few conditions that may trouble young lambs. One of these is indigestion or scours caused by the lamb getting too much milk. Reducing the feed of the ewe will usually correct this condition. Indigestion usually leads to "pinning," and this condition can be corrected by removing the tail of the lamb so that sticky feces will not keep the tail pinned down. In case the lamb develops a "drawn" condition, he is probably not getting enough milk; increasing the feed of the ewe or supplementing the ewe's milk may be advisable.

Young lambs must be protected from the weather or elements during the first few weeks of their lives. During the time the lamb is kept in the lambing pen it should be kept warm enough so it shows no evidence of chilling. As the lamb grows more fleece it can be kept at colder temperatures; even after a lamb is two or three days old it can stand considerable cold weather providing its fleece is kept dry. Lambs are occasionally kept so warm that both they and their mothers sweat and become uncomfortable, and this is not a desirable condition. The lambs and their mothers should be kept in a well ventilated, dry place, that is free from drafts.

The first two or three days of a lamb's life should be considered the most important. If the lamb is properly started during this period and kept going for the next two or three weeks, the sheep man can figure the lamb is about ready for market as far as attention is concerned. Proper care or attention to minor details during the first few days of a lamb's life is very important and will materially increase the profit from raising lambs.

Care and Management of Lambs

DOCKING.

As soon as the lamb is two or three days old, it is a good idea to remove the tail. This is usually referred to as "docking" the lamb. When the tail is removed at an early age there is no fat to interfere with healing, and the tail stub heals more quickly than it does if the lamb is allowed to get older before being docked. Also, there is less loss of blood when the lamb is comparatively young. Lambs should ordinarily be docked before they are removed from the lambing pen and put with other ewes and lambs.

The tail can be very easily removed with a good sharp knife. One method is to place the lamb between the legs of the operator, pull the tail out straight and insert the knife blade under the tail at the desired distance from the base. The operator then pulls up and out on the knife, down on the tail, and the tail is very easily and quickly removed. It is known that a good, sharp knife wound will heal more quickly than a wound caused by removing the tail by other methods.

In case the lamb bleeds excessively he may be held for a few minutes and the tail stub pressed against his body. If this does not stop the bleeding, tie a string around the tail very tightly and leave it on for about fifteen minutes. After that period remove the string to prevent the tail stub from sloughing off.

The lambs should always be handled quietly and gently. Early morning is a good time to remove the tail.

A good fly repellent (smear 62 is very satisfactory) should be applied around the wound if the tail is removed in "fly season."

CASTRATION.

All ram lambs that are not to be retained for breeding purposes should be castrated at about 10 days to 2 weeks of age. Some operators castrate and dock at the same time; and under range conditions this may be advisable because it saves getting the flock together twice. Under farm conditions here in Oklahoma it is better to separate these two major operations by a week or more.

There are several ways to castrate a ram lamb, but the simplest and probably the most satisfactory way is to cut off the lower third of the scrotum and remove the testicles through the opening. One should be sure that the wound is disinfected properly; some standard disinfectant should be used at the strength recommended by the manufacturer. A fly repellent should be put around the wound if there is danger of flies bothering the opening. In case a ram is found to be ruptured, he may be repaired by sewing the scrotum together inside with a sterile cord or thread. One should be careful not to close the entire opening of the scrotum because this prevents proper drainage. Some operators prefer to use so-called "bloodless" methods of castrating such as an emasculator; or to castrate the lamb by placing a rubber band very tightly around the base of the scrotum. These methods are less satisfactory in general practice than removing the testicles because any slips or improper castration will result in his receiving the same standard dock at the market as if no attempt had been made at castration. Castration by "bloodless" methods is slower than castration by the more accepted method.

FEEDING THE GROWING LAMB.

The lamb should be well fed during his entire nursing period if he is to be put on the market carrying the maximum amount of "milk bloom." In general, there are two ways to feed the lamb. First, he may be fed through the ewe by an adequate milk flow. A second method is creep feeding. This means providing a place where the lamb can eat grain and the mother is kept out.

RATIONS FOR NURSING EWES.

It is well to give the ewes enough feed so they will produce a maximum flow of milk even if the lambs are creep-fed, but there

is no object in having the ewe gain weight during the lactation period. An experiment at the Oklahoma Station indicated that a ewe in dry lot will milk as satisfactorily when fed a pound of oats as when fed one and one-half pounds of oats daily. A third lot of ewes in the same experiment were fed no grain at all but were allowed to run on adequate wheat pasture. The latter ewes milked just as satisfactorily as did ewes in dry lot that were receiving grain, hay and silage but had no access to green feed. The lambs on the three groups of ewes made very similar gains when all were creep-fed. A fourth group of ewes were given a light feed of grain in addition to the wheat pasture. Their lambs ate more grain in creep than those nursing the more heavily fed dry-lot ewes, but over all economy of production was highly in favor of feeding the extra grain to the lambs rather than to their mothers.

On Pasture.—Winter wheat pasture is one of the best and cheapest sources of nutrients for ewes which are nursing lambs. If abundant wheat pasture can be supplied the ewes will need no other feed, although many people like to have dry roughage available also. If the wheat pasture becomes inadequate, grain and roughage should be added to the ewe's ration at night.

In Dry Lot.—If the ewes are kept in a dry lot, the ration can consist of a roughage and any one of the common grains. Ewes nursing lambs will need approximately 1 pound of grain per head daily in addition to what roughage they will eat. If the roughage is legume hay such as alfalfa or lespedeza, no protein supplement will be needed. If the roughage is a non-legume such as prairie hay, corn fodder, kafir bundles or sudan hay, the ewes must be fed approximately $\frac{1}{4}$ pound of high protein supplement per head daily. Silage is very good feed for ewes that are nursing lambs, and it may replace the hay at the rate of 3 pounds of silage for one pound of hay. Ordinarily, a ewe nursing a lamb will eat approximately 4 pounds of dry roughage per head daily so the silage adjustment should be made accordingly; many producers hesitate to use silage for more than one-half or two-thirds of the roughage allowance. Ewes nursing lambs are usually fed all the roughage they will consume because it is not only one of the best feeds but also usually the cheapest source of nutrients.

CREEP-FEEDING LAMBS.

Creep feeding commercial lambs that are to be placed on the market as milk-fat lambs is a practice that cannot be too highly recommended. A good many advantages can be expected.

Lambs that have access to grain in the creep will grow and fatten more rapidly, be ready for an earlier market, and be more nearly in top market condition when sold than will non-creep fed lambs. Creep feeding is of particular advantage in finishing twin lambs, because they ordinarily do not have quite as much milk as a single lamb.

A creep may be any structure that will keep ewes out and allow the lambs to enter. The grain that is provided in the creep should be changed daily and should be kept clean. The trough should be so designed as to keep the lambs out of the trough. Lambs will usually start eating grain in a creep at approximately two to three weeks of age, although the amount they will eat will be quite limited at first. As the lambs grow older they will increase their grain consumption. Oats is generally used as the first creep grain because lambs find oats very palatable. Wheat bran is sometimes used as a starting creep grain. After the lambs have been fed oats or other similar palatable grains for some time, these grains can be replaced with cracked corn, and later shelled corn can be used. However, if the lambs are to be carried through the summer they should be continued on the lighter grains until the weather cools off.

It usually requires between 25 and 50 pounds of grain to satisfactorily creep feed a lamb to market weight. The amount of feed required will, of course, depend upon the amount of milk the ewes are giving, the pasture available, and the weight to which the lambs are carried.

Ordinarily it will not pay to creep feed market lambs that are to be carried past the middle of June or the first of July before they are sold. Creep feeding lambs marketed after this date is usually not profitable because the lambs will ordinarily lose much of the milk or creep-feed bloom during the hot weather. Such lambs are ordinarily not ready for the market until after cool weather comes in the fall and must regain the weight and bloom lost during hot weather.

FEEDING ORPHAN LAMBS.

Even in the best managed flocks an orphan lamb may occasionally need to be raised. Ordinarily a lamb can be adopted to another ewe (see page 24), and this is certainly preferable to raising the lamb by hand. If another ewe is not available one of the best ways of raising an orphan lamb is to put the lamb on a milk goat. If these possibilities are not practical, the only alternative is to sacrifice the lamb or feed the lamb by hand. This, of

course, becomes quite laborious. There are several precautions that must be followed if the lamb is to be raised successfully. In the first place, the lamb should never have all the milk at one time that he will take. Usually the lamb should be started out with approximately 2 ounces of milk per feed and fed every two hours. Goat's milk is very satisfactory but most producers will have cow's milk readily available. Only whole milk should be used, and preferably the milk should be from a high testing cow because ewes' milk is higher in fat content than that of cows. As the lamb gets older the amount of milk may be increased and the interval between feedings can be lengthened. It is necessary to be as sanitary in feeding a lamb as one would in feeding a human baby if best results are to be obtained. The milk should be fed at body temperature and the length of time between feedings must be kept uniform for best results. If the lamb develops indigestion and scours, a tablespoon of castor oil should be administered and the amount of milk allowed per feeding should be reduced.

MARKETING LAMBS.

Commercial lambs that are born in the late fall or early winter are usually ready for market at four or five months of age if they are properly grown out and fattened. Lambs sold on the market directly from their mothers are usually referred to as "milk lambs" or "genuine spring lambs" even though they are often born in the fall. There is a considerable advantage in having the lambs on the market before the first of June, and nearly all Oklahoma producers should strive for this goal. There are four reasons why marketing before this date is advisable:

1. The lambs can be sold at the highest seasonal market price.
2. They can be marketed without trouble from internal parasites.
3. They can be sold before hot weather.
4. Both the lambs and their mothers will have made a maximum use of green winter pasture.

The high seasonal price for milk lambs is usually in March, April, and May, and the market is usually at its very peak approximately two weeks before Easter. This is particularly true of light, well-finished milk lambs that are desired by the eastern trade around the Easter season. Lambs marketed before the first of June are usually not bothered by internal parasites, whereas lambs that are pastured through the summer months are often

quite seriously troubled by internal worms such as the stomach worm and the nodular worm. After the weather becomes warm the operator must take exceptionally good care of his lambs if he is to maintain the weight they already carry, and he can get them to gain only through exceptional care and feeding. Oklahoma winter and early spring weather is very satisfactory for sheep, but the dry and hot weather often experienced in July, August, and early September leaves much to be desired as weather for producing fat lambs.

There are several important market requirements for high quality milk lambs:

(1) The lambs must be fat. The packer can make very little use of a thin lamb.

(2) The lambs must be of acceptable weight. Very commonly packers will discriminate against lambs after they reach excessive weight. Ordinarily, weights in excess of 100 pounds are less desirable than lighter weights. In certain seasons, lambs as light as 70 or 80 pounds may be preferred over the heavier weights. Each producer must decide at what weight he wants to market his lambs. Very often, because of low cost of production, he will find his over-all operation more successful if he carries his lambs to heavier weights rather than marketing them at the extremely light weights and correspondingly higher prices.

(3) Lambs must be of high quality. Quality is demanded in lambs because they are eaten by people desirous of a light quality product.

Lambs lacking in any of these three essentials will not attract buyers; consequently, lambs must be well bred and well fed to sell at the best advantage.

Some producers follow the practice of "topping out" their lambs as they become fat, selling all the lambs that are fat at one time. This usually necessitates marketing the lambs two or three times during the season and it is particularly advantageous for operators selling two or three truckloads of lambs during the season. Small operators may want to sell all of their lambs at one time, and this may necessitate selling a few unfinished lambs as well as a few lambs that will be too heavy to top the market.

It is a very common practice in Oklahoma to sell both the ewe and wether lambs and to make no replacements in the breeding flock from lambs raised on the farm. This means that re-

placements must be purchased from time to time as ewes are removed from the flock. It usually means also that the ewes that are to be called from the flock are sold at the same time the lambs are marketed.

In exceptional cases, in which it appears desirable to save ewe lambs for the breeding flock, they are usually saved back at weaning time. The disadvantage of saving ewe lambs for flock replacements is that the top ewe lambs will usually sell so high as fat lambs that they become very expensive by the time they are grown out to a breeding age. They will, of course, have better mutton characteristics than the fine wool ewes, particularly if a high quality purebred mutton ram has been used in producing the lamb crop. On the other hand they will have many of the characteristics of mutton ewes, and this means that they will breed later than will the average fine wool ewe. In fact, they usually breed enough later so they are not as desirable for commercial production as are the straight fine wool ewes purchased from the ranch country. This criticism would not be true of Dorset or straight fine wool ewes that might be produced on the farm.

The market expense for disposing of the lamb crop will depend upon the distance the lambs must be transported to market. Freight is a major cost in marketing. Other marketing expenses that should be kept in mind are the shrink enroute to market, yardage, commission, and the feed charge that is made at the terminal market. These charges, except that of shrinkage, are usually already set, and the operator can not do much to reduce them. He can, however, handle the lambs to get minimum shrinkage. Lambs that have been nursing their mothers should be kept with the ewes as near to loading time as possible. Most operators prefer to load them right from the ewes.

Trying to fill lambs exceptionally full before they go to market is not a good practice. Forcing the lambs to take extra feed or salting them exceptionally heavy to get them to consume extra water will usually result in scouring and consequent loss of weight.

Summer Care of the Flock

After the lambs are weaned, only those ewes being retained for another breeding season should be kept through the summer. Poor milking ewes or those with bad mouths or bad udders should be sold. It is unprofitable to fatten cull ewes and they should be sent off to the market just as they are.

Sheep that are provided with water, salt, mineral, shade and a reasonable amount of pasture will do well during the summer months if they are kept free of internal parasites. Drenching the ewe flock in the spring of the year and in the fall with phenothiazine, as well as keeping phenothiazine salt before them during the summer months, will be useful in keeping down internal parasites. The salt mix can consist of nine parts salt and one part of phenothiazine. If there has been a very heavy infestation of parasites on the farm previously, more frequent drenching may be needed.

If any lambs do not get fat enough to be sold they should be weaned and given extra good pasture as compared to that provided the ewe flock. It is always a good idea to shear any lambs that are to be carried through hot weather for either market or breeding. The only time summer shearing is not to be recommended is for breeding lambs that are to be exhibited at early shows or fairs.

FATTENING FEEDER LAMBS

There are two general ways of fattening feeder lambs. One is to fatten them on abundant wheat or other small grain pasture, and the other is to feed them out in dry-lot. The former method is usually preferred in Oklahoma. Dry-lot feeding is not customarily practiced in this state unless lambs have been started on wheat pasture and have not become sufficiently fattened to sell as fat lambs. Operators often take unfinished lambs off pasture and finish them in dry lot.

The lamb feeder should keep in mind that there are two sources of profit in feeding lambs. One is the margin of increase in the price of the lambs per pound between the time the lambs are bought and sold. The other is the profit in producing the grain at less cost than it sells per pound. The farmer's chief source of profit is usually margin; most feeders feel that approximately 2 cents margin is necessary. The average death loss in feeding lambs in the United States is approximately 4 percent, but careful management and careful feeding will materially reduce this figure.

Feeder lambs must be light enough when purchased that they can put on 30 or 35 pounds before they reach excessive market weight. This usually means buying the lambs in a range of 55 to 65 pounds or an average of 60 pounds if they are to top the market when finished.

Sources of Feeder Lambs

Feeders have two choices in selecting a source of lambs. They may either buy native lambs or they can buy fine wool lambs from the western range.

Native lambs can often be obtained locally, but quite frequently they are infested with parasites. Great precaution should be taken to see that native lambs are treated for internal parasites before they are started on feed. If such treatment is given and the proper weights selected, native lambs very often can be handled quite profitably as feeder lambs.

Most operators prefer to get lambs from the western ranges, because those lambs usually carry fewer internal parasites. One may, however, under-estimate the number of internal parasites in lambs, and it is always a good idea to treat the lambs for internal parasites before they are started on feed. Naturally, it is easier to obtain the western lambs in sizable numbers and uniform quality.

Fattening on Wheat Pasture

With abundant wheat pasture, about all that is necessary is to see that the lambs have been treated for internal parasites and are full of dry feed before being turned on the pasture. Lambs will make very satisfactory gains on wheat pasture if the pasture is abundant. Experiments at the Oklahoma Station indicate that usually it does not take extra feed, such as grain or dry roughage, to get satisfactory gains from lambs on wheat pasture. If it is anticipated that pasture may become short later in the season, feeding a small amount of grain may be advisable so that the lambs may become accustomed to eating and will shift over to a full feed ration more easily than if they had not previously eaten grains. Likewise, a small feeding of grain may aid in getting the lambs to come in to a central corral at night.

Dry-lot Fattening

Lambs to be fed in dry-lot should be filled on dry hay and then started slowly on their grain ration. It is a good idea to full feed the lambs on roughage in the early part of the fattening period and then to increase the grain gradually. In the first few days of the period the grain should be fed in very small amounts—about what the lambs will clean up in four to five minutes. This amount is usually about 1/10 pound per head per feed for the first few feeds. Oats is an excellent feed to use in starting lambs on feed. The

heavier grains may be substituted later. The lambs should be fed no more feed at any one time than all lambs will stand at the trough and eat. Usually it will take about two weeks to work the lambs up to where they will be eating as much as 1 pound of grain per head daily.

Good feeders watch the droppings of the lambs, and if the lambs show marked tendency for the feces to soften they will reduce the amount of grain. After two to three weeks the feeder should have the lambs eating approximately 1 pound of concentrate per day and 1½ pounds of roughage. In approximately six weeks the fattening ration should consist of approximately one-half roughage and one-half grain, or approximately 2½ pounds of total feed. In the later stages of the feeding period a good ration should consist of about 1 pound of hay per head daily and approximately 1½ pounds of grain.

Alfalfa hay is considered the most satisfactory hay for fattening lambs, but the non-legume hays can be used. In case of non-legume hay or non-legume silage is used, one of the high protein supplements should make up approximately 25 percent of the concentrate mixture. No more roughage should be fed than will be cleaned up from one feed to another. If silage is used it should be remembered that it takes approximately 3 pounds of silage to equal 1 pound of dry roughage.

Lambs fattened in dry-lot will usually gain at the rate of about 1/3 pound per day and it usually takes from 100 to 120 days to properly finish the lambs.

Corn is considered the standard fattening grain. Oats have a value equal to that of corn when they make up only half of the corn in the ration; the value of oats is materially less when they are fed without corn. Barley has a value approximately 90 percent that of corn, while the grain sorghums have values of from 90 to 100 percent that of corn.

Marketing Fed Lambs

If the lamb feeder has over 100 head of lambs he will usually "top out" those that get fat first, sell them, and allow the others to acquire more finish. Good producers usually sort their lambs and market them as they get ready without trying to market all of them at one time. Lambs are carefully sorted at the market and any unfinished lambs are sold at a considerable discount.

THE WOOL CROP

While the income from wool does not gross as much as the sale of the lambs it should be kept in mind that the properly prepared fleece usually more than pays for the cost of feeding the commercial ewe. Certainly this important crop should not be neglected but given the care and attention that it justifies.

Shearing

Sheep are usually sheared in April in Oklahoma, but occasionally earlier shearing is practiced if housing is available to protect the sheep after they are born. Shearing in May or later in the season usually causes the sheep to suffer unduly from hot weather.

Any good, clean, dry place where foreign matter may be kept out of the fleece is satisfactory for shearing. A concrete or board floor is preferred, but a sheet of canvas makes a very satisfactory shearing surface.

Machine shearing is usually preferred to hand shearing and most operators hire an expert to shear their sheep. A person skilled in shearing will get the maximum amount of wool from the sheep and leave the sheep in the best possible condition. Hand shearing with a pair of shears or blades is satisfactory when properly done; but it is quite a laborious task and not many people are skilled at the operation. Sheep should be kept dry prior to shearing. They often are confined to rather close quarters for a few hours before shearing so they will "sweat" to a considerable extent and thus bring the yolk out in the fleece. This makes the wool fiber easier to cut.

The fleece should be taken off in one piece, tied with the flesh side out, and bound with a paper wool twine. Under no circumstances should ordinary binder twine be used in tying up the fleece. After the fleece has been tied it should be stored in a well ventilated, dry place that is free from dirt, chaff, or other foreign materials. When the wool is packed for market it should be pressed tightly in regular wool sacks. Wool of different grades should be kept in separate sacks; fine wool can be placed in one sack and the medium wools in another sack.

Factors Affecting Wool Grades

The value of the wool will depend upon several factors. One of the primary factors considered by the buyer in evaluating wool is the shrinkage, and Oklahoma wools have a higher shrinkage than wools produced in many other sections of the country. A second factor in the price of wool is the length of the fiber. Wools that are

over a specified minimum length are classified as "combing" wools and usually outsell shorter wools from 2 to 5 cents a pound. The shorter wools are classified as "clothing" wools. A third factor is the fineness of the fiber, because fineness of the fiber determines the use to which the wool may be put. A fourth is the freedom of the wool from foreign material such as hay, burrs, chaff, etc.

As a rule Oklahoma wools are referred to as semi-bright wools rather than bright wools because they contain considerable grease and dirt. It is because of the amount of grease and dirt that Oklahoma wools carry that they are not quite as favorably known on the market as are wools from areas that are known to produce a cleaner product. This should not discourage the Oklahoma operator, but encourage him to strive to produce as good a fleece as sound, economical management will permit. An aid in this direction is to remove dirty tags and locks, or practice what is sometimes referred to as "skirting" the fleece before the fleece is wrapped. This operation and the precautions already mentioned take little effort and put the wool clip on an acceptable form for sale. The operator should not be discouraged unnecessarily because his wool has a high shrinkage and a correspondingly low price per pound because of sand and dust that has blown into it before shearing. Fleeces that carry excess foreign materials will weigh more than fleeces that have carried less dirt and oil.

Marketing Wool

In general, wool can be sold in one of three ways:

(1) To local buyers. On such sales the producer turns the wool over to the buyer at quoted market prices without further interest in the clip.

(2) Cooperative marketing, which is not at all uncommon in Oklahoma. In such case the wool is consigned, a down payment is given, and final settlement is made after the marketing association has disposed of a season's wool clip. The total returns may be greater, but the producer has had his money invested for a longer period of time and has assumed the risk of market fluctuations.

(3) Consigning the wool directly to large wool brokers. Ordinarily, Oklahoma operators do not have sufficient volume to justify this method of marketing; but large ranch operators commonly store their own clip in bonded warehouses and take a personal interest in the sale of the wool. There is usually a period of three to six months from the time wool is shorn until it is purchased by the mills.

PASTURE CROPS FOR SHEEP

Sheep are suited by nature to consume large amounts of forage; and pasture is not only the cheapest but the most satisfactory feed for sheep. All precautions should be taken to have an ample amount of grazing for the sheep at all times.

In general, pasture crops will come under two headings, "native" and "introduced." Among the native pastures in this area we have our tall or bunch grasses and buffalo grass. Among the permanent type pastures that have been introduced are Bermuda grass, rye grass, lespedeza, and the hop and bur clovers.

Permanent pastures should be expected to carry the sheep for a portion of the year; but these should be supplemented by temporary pastures so that we can have 12 months grazing, or as nearly that amount of grazing as the season will allow. Legumes are desirable temporary pastures. Alfalfa is very productive, but some operators are afraid it will cause bloat. If sheep are to be grazed on alfalfa, they should be full at the time they are put on the pasture and allowed to remain without again becoming hungry. Such handling prevents them from overeating at any one time. Sweet clover pasture may be used to a certain extent, but unless grazed rather closely it will become coarse and unpalatable. Cowpeas have been successfully grazed in some areas in Oklahoma and provide a very palatable forage during the time they are available. In general, it should be kept in mind that the legumes are very high in protein, are very nutritious, and leave little to be desired as a pasture plant except for the possibility that some may cause bloat.

Many successful sheep men plant a small pasture of some one of the cereal grains early in the fall so that it will be ready before the bulk of the small grain land on the farm will be furnishing winter pasture. This same area may be grazed late in the spring of the year, without regard to the grain crop, and allowed to remain a livestock pasture until the permanent pastures are ready to carry the flock.

Two non-legume temporary pastures that can be used for summer grazing in Oklahoma are Sudan grass and "rape," but both have a limited adaptability. Sudan makes a very excellent pasture and considerable feed, but one must be careful that it does not grow away from the sheep and become so coarse they will not graze uniformly. Sudan has the disadvantage that chinch bugs damage it very decidedly in certain seasons. Rape is a very desirable crop in some of the more northern states, but Oklahoma weather is

usually too dry and hot in July and August to make good use of this crop. Permanent pastures, legumes, and summer-sown crops will carry the flock of sheep from spring until the first freeze in the fall. Other crops, such as winter wheat, winter oats, rye, and barley, can be used to furnish excellent grazing during the winter months. Spring oats can be used for early spring grazing.

The exact pasture program that the sheep producer uses will depend upon the area of the state in which he is located. If soil and moisture permit, it is highly desirable to introduce suitable legumes into permanent pastures.

There is a very common belief that sheep and cattle will not satisfactorily graze the same area. This is erroneous. Sheep and cattle can be allowed to graze together satisfactorily, and the total carrying capacity of a pasture is usually increased if a proper combination of the two classes of livestock are used. Sheep tend to eat weeds from the pastures, and they also eat some species of grasses for which cattle do not seem to care particularly. On the other hand, cattle eat the coarser forage that sheep do not relish. When sheep and cattle are grazing together one should be careful about over-grazing, because sheep will eat a pasture more closely than it should be grazed if they are forced to do so, and can live where cattle will starve. In calculating the grazing capacity of an area in terms of sheep or combination of sheep and cattle the thumb rule of "six ewes for one cow" can be used.

Pasture—whether it be native or seeded or whether the animals are sheep or other livestock—is the most economical method of producing pounds of meat and should be handled in such a manner that the maximum economic production is received without unduly damaging the crop.